

Historic, Archive Document

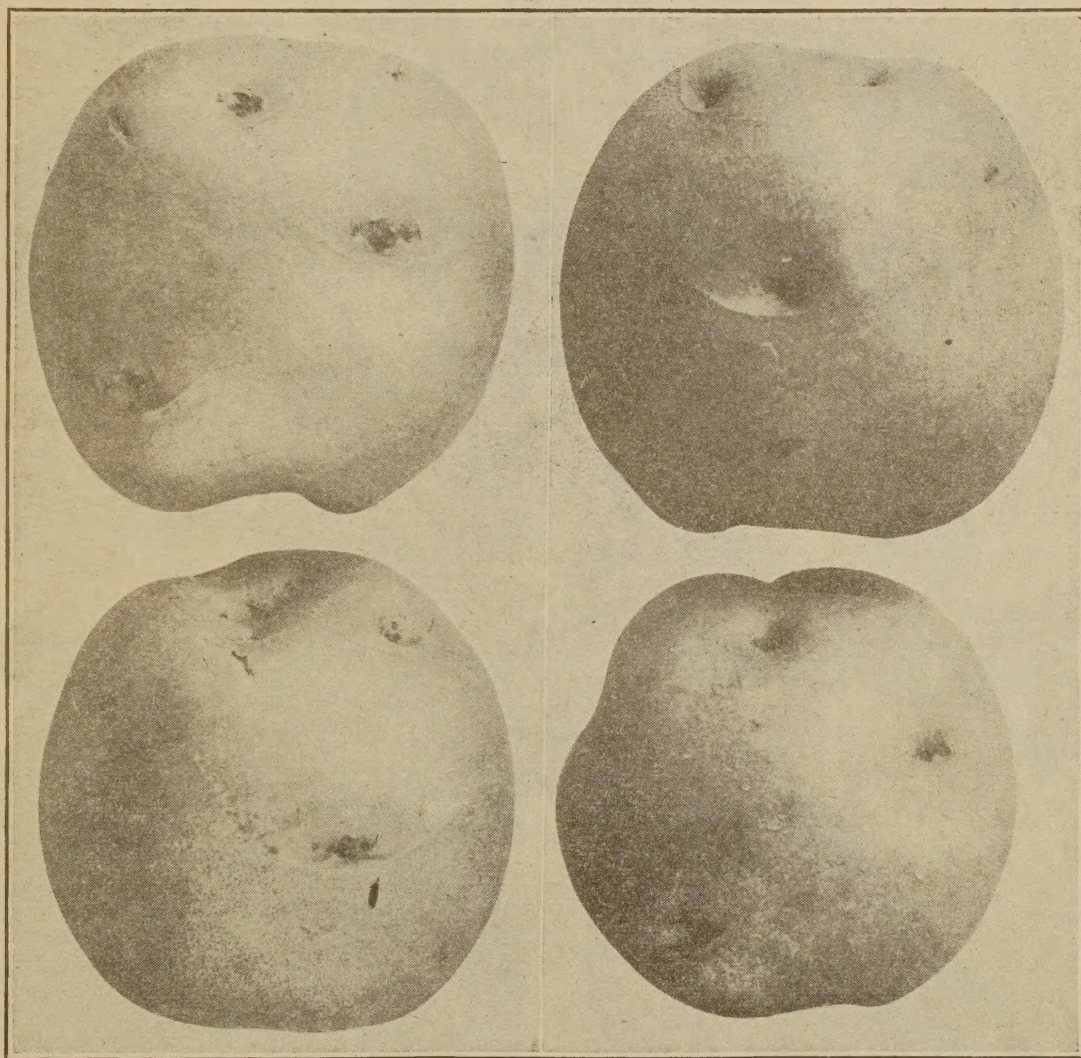
Do not assume content reflects current scientific knowledge, policies, or practices.

1
P6976

LIBRARY
JUL 23 1918

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
OFFICE OF COTTON, TRUCK, AND FORAGE CROP DISEASE INVESTIGATIONS
and
OFFICE OF HORTICULTURAL AND POMOLOGICAL INVESTIGATIONS
WASHINGTON, D. C.

GROWING HIGH-GRADE POTATO SEED STOCK



Type Specimens of Triumph Potatoes



FIG. 1.—A potato plant showing mottling and crinkling of the leaves, a type which is undesirable in the seed plat.

GROWING HIGH-GRADE POTATO SEED STOCK.

FARMERS may obtain better seed potatoes for next year by giving the subject a little special attention this summer.

Next fall will be too late. The old methods of selecting the most perfect tubers from the bin, rejecting those showing defects, and treating with chemicals for disease control are good as far as they go; but they fail to reach the destructive seed-borne diseases and weaknesses which do not change the appearance of the seed, and they do not necessarily eliminate varietal mixtures.

WATCH THE PLANTS.

A much greater measure of success may be obtained if careful selection is carried out on the plants during the summer. Varietal mixtures and weak and diseased plants can readily be detected and removed from the growing crop.

HAVE A SEED PLAT.

In seed-producing sections all progressive growers should maintain a seed plat for the purpose of improving their own seed supply. The seed plat may be either a separate field or a portion of the commercial planting set aside for special attention. An area of one-tenth to one-fifteenth of the entire acreage will usually provide sufficient seed for the following season's planting.

BEGIN THIS SUMMER.

While it is an advantage to start the seed plat with selected material, the work may be begun during the growing season with any good stock of promising quality planted in suitable soil and properly cared for. The essential requirements are (1) stock of good potential vigor reasonably free from disease, (2) suitable soil, (3) adequate but not excessive fertilization, (4) good cultivation and care, (5) careful elimination of undesirable hills during the progress of the season, (6) proper winter storage, (7) thorough sorting, and (8) treatment with chemicals (if necessary) before planting the next season.¹

¹ For a more detailed discussion of the methods and limitations of seed treatment, see "Selection and treatment of seed potatoes to avoid diseases," Bureau of Plant Industry, C., T., & F. C. D. Cir. 3, which may be obtained free of charge from the Division of Publications, United States Department of Agriculture.

START WITH A GOOD STRAIN.

Stock of any adapted standard commercial variety of good potential vigor is suitable provided it is reasonably free from disease, particularly from the tuber-borne troubles of the degenerate type mentioned later. Stock that produces more than a small percentage of



FIG. 2.—A type of plant undesirable in the seed plat.

weak or degenerate hills does not respond well to selection, but is almost sure to give disappointing results. It is better to discard doubtful strains entirely, disposing of them for table use and replacing them with stock from new sources of known satisfactory performance and yield.

GROW THE PLANTS WELL.

A superior grade of seed potatoes can not be produced unless the plants are provided with good growing conditions. The best portion of the field, therefore, should be selected for the seed plat. Good drainage is essential. A sandy or gravelly loam, with clover or alfalfa sod, is preferable to other soils, though not absolutely necessary.

Deep cultivation during the early growth of the plant, followed by shallower ones, assists in developing a good vigorous root growth and also serves to conserve the moisture, as well as make larger amounts of plant food available. The number and frequency of the cultivations should be governed by the character of the season and the soil. Neglect in cultivation is not conducive to the production of a superior grade of seed stock.

SPRAY EARLY AND WELL.

In regions subject to early-blight or late-blight, thorough spraying with Bordeaux mixture under high pressure should be practiced. Spraying also aids in the control of the flea beetle and of tip-burn.

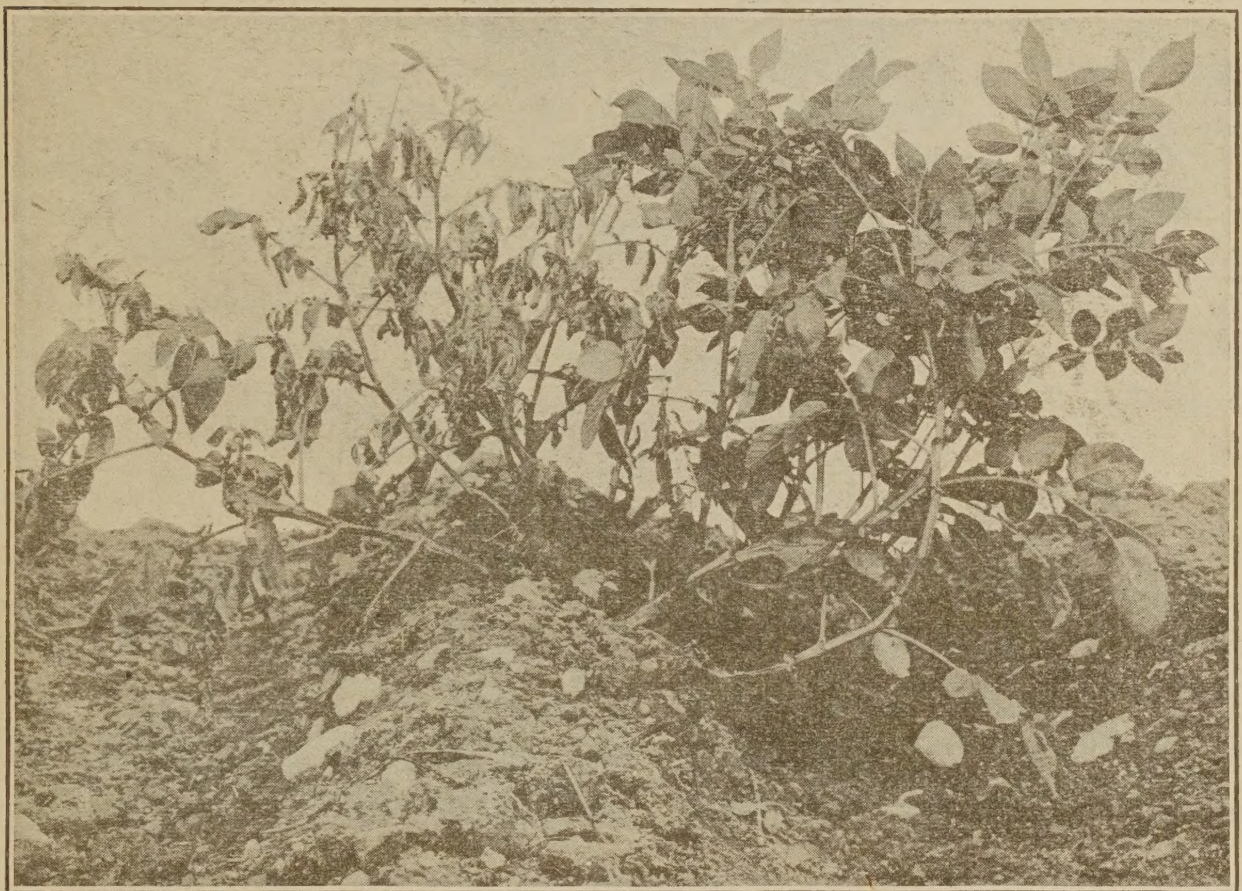


FIG. 3.—Another type of plant undesirable in the seed plat.

It is highly essential to make the first application for the control of late-blight early, before the lower leaves are sheltered, so that they may be thoroughly covered; otherwise they become serious centers of infection during the critical period later. After this first application it is necessary to spray only to cover the new growth as it develops.

ELIMINATE ALL VARIETAL MIXTURES AND DISEASED AND WEAK HILLS.

Several times during the season the seed plat should be inspected by walking the length of each row, observing the individual plants for evidence of disease. The weak, degenerate, and diseased hills,

and varietal mixtures should be pulled; and, if tubers have formed, these should be dug out and removed from the field at the time, so that only the progeny of healthy hills of the correct variety will remain at harvest time. It is necessary to go over the plat at least two or three times in order to detect all the objectionable plants. Varietal mixtures are most readily found when the plants are in bloom. Some diseases are seen early, while some develop only later. The plants to be removed may be considered, for practical purposes, as belonging in the following groups: (1) Varietal mixtures; (2) plants showing stem-rot either at or below the surface

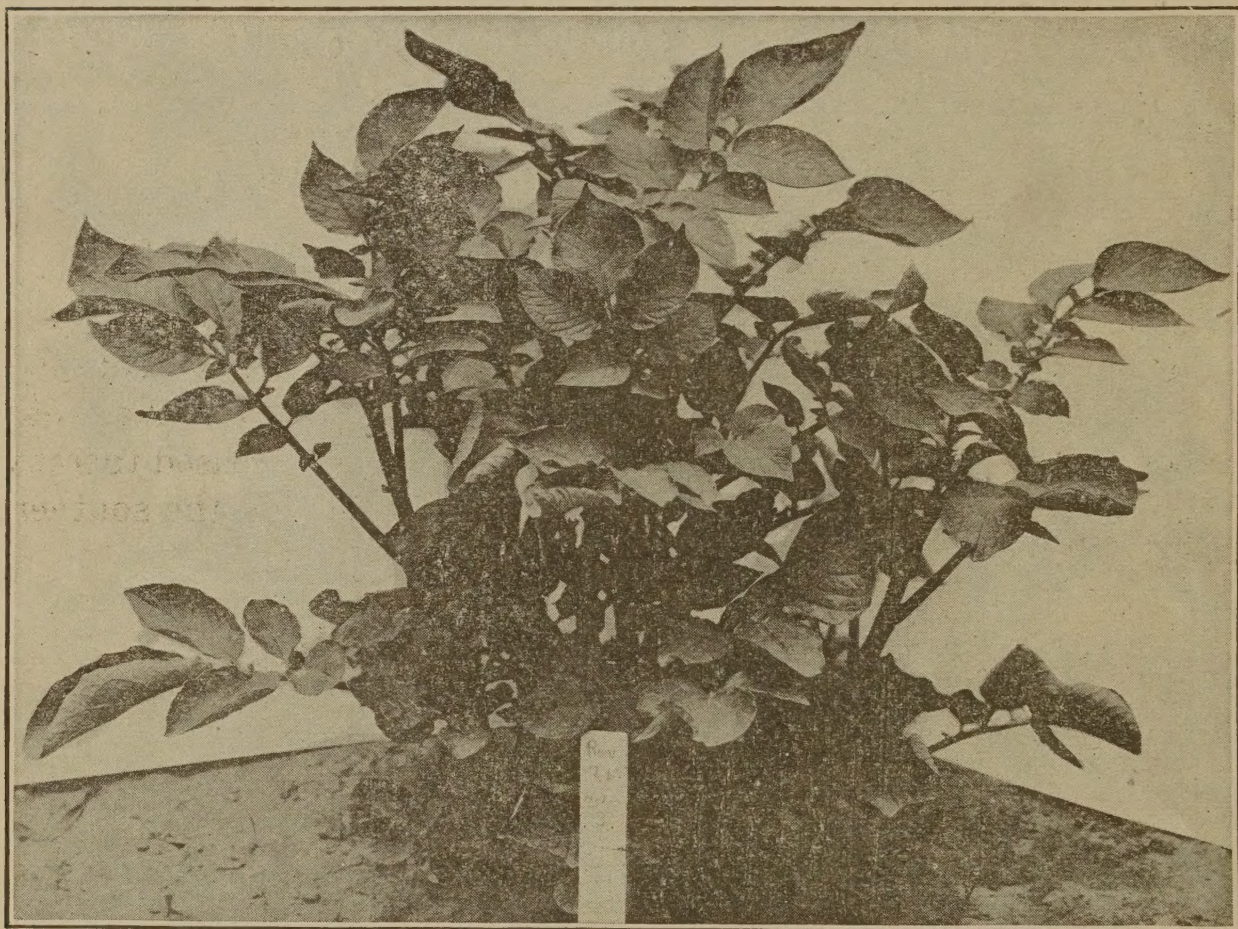


FIG. 4.—A potato plant showing a peculiar rolling of the lower leaves, a type which is undesirable in the seed plat.

of the soil (black-leg and Fusarium stem-blight); (3) plants developing any type of abnormal rolling of the leaves, whether leading to premature death of the plant or not (Fusarium wilt, Verticillium wilt, Fusarium blight, Rhizoctonia rosette, late black-leg, leaf-roll, curly-dwarf); (4) plants with mottled or mottled and crinkled leaves (mosaic, mosaic-dwarf, and curly-dwarf), (5) evidently stunted, weakened, or unthrifty plants. (Figs. 1-4.) All the diseases enumerated above are carried from season to season by seed tubers. Only the Rhizoctonia and Fusarium troubles are known also to be carried over in the soil, unless it may be the rather uncommon but destructive leaf-roll, about which evidence is incomplete and opinions differ.

Mosaic deserves special attention. This trouble is becoming widespread and serious on certain varieties like the Green Mountain and Bliss Triumph. In badly infected stock a large proportion of the diseased plants become dwarfed, have crinkled foliage, and fall very low in productivity. The Bliss Triumph variety, grown extensively for the southern seed trade, is so generally infected that many experienced growers erroneously consider the crinkled, mottled leaf normal for the variety. The cause of the mosaic is unknown, and no complete means of control has been found, but rigid roguing in the seed plat eliminates the dwarfed, stunted, low-yielding plants from the progeny the following year, greatly increasing the yield. It is profitable to remove all mosaic plants from the seed plat, even if it amounts to half or two-thirds of the total number, as it may the first year. This will not entirely eliminate the disease, and it is probable that a proportion of the progeny will still show some signs of mottle-leaf, but the dwarfed plants will be absent or few. The second year the seed plat will contain a much higher percentage of healthy plants. The mosaic is worse in the South than in the North, and growers who produce Bliss Triumph potatoes for the southern seed market should certainly maintain a seed plat for their own acreage. Their own yields will not only be greatly increased thereby, but the effect will be reflected even more strikingly in the southern fields.

HARVESTING THE SEED PLAT.

At the close of the season the plants which have remained healthy may be dug with a potato digger and the total yield saved for seed, but, if time permits hand digging, a further selection may advantageously be made by eliminating all the low-yielding hills; also those producing an undue proportion of small or unshapely tubers. A further step may be taken at this time, which will materially assist in the subsequent development of a high-grade strain of seed potatoes, by selecting the progeny of the good-yielding and most uniform hills to be used for the planting of the following season's seed plat. See the illustration on the title-page. The remainder of the seed produced on the seed plat can then be gathered for the main-crop planting next year.

HANDLE AND STORE PROPERLY.

The seed should be so handled from the start as to avoid unnecessary cutting, bruising, or other injury, since the vitality of damaged tubers is reduced. This can best be accomplished by gathering and storing the seed potatoes in slat crates, thereby avoiding any further injury in handling. It is desirable to place the crates in storage as soon as possible after harvesting. Stored in a cool and reasonably

moist storage house, provided with good ventilation, and maintained at a temperature of 36 to 40° F., or as near these figures as possible, the seed should come out in the spring in almost as good condition as when placed in storage.

SORT AND TREAT WITH CARE.

Before the next planting time the stock should be carefully worked over, to remove all badly cut or bruised tubers and those showing serious scab or black-scurf and decay of any kind. Tubers badly off type should also be discarded, as should any showing abnormal discoloration of flesh, which can be seen, of course, only at the time of cutting. If scab or black-scurf is present in any degree, it is advisable to treat the seed by covering for 30 minutes in a solution containing 4 ounces of corrosive sublimate to 30 gallons of water.

BECOME A SEED GROWER.

The seed-plat method with potatoes in the hands of careful growers promises to improve greatly the general average of seed stock, and it looks forward a step toward the development in America of a much-needed group of successful specialized professional potato-seed growers, whose function will be the production of seed potatoes in distinction from potatoes to be sold for seed.

H. A. EDSON.

WILLIAM STUART.

Approved:

WM. A. TAYLOR,
Chief of Bureau.

JUNE 20, 1918.